

PHILIPPINE CITIES & COMMUNITIES: ASPIRING TO BE RESILIENT, INCLUSIVE & SUSTAINABLE AMIDST CLIMATE AND DISASTER RISKS

COASTAL
CITIES AT RISK
IN THE
PHILIPPINES
Investing in Climate
and Disaster Resilience



ATENEO DE MANILA
UNIVERSITY



ARETE



Emma Porio, PhD

CCARPH Project Leader & Principal Investigator
Professor, Ateneo de Manila University
Science Research Fellow, Manila Observatory
Co-Chair, NPTE, Climate Change Commission (Philippines)
Co-Chair, International Climate Change Council, Adaptation Workstream



Coastal Cities at Risk in the Philippines: Investing in Climate and Disaster Resilience.



<https://resiliencetoolkit.ph>



<https://coastalcitiesatriskph.com>



<https://linktr.ee/ccarph>

Emma Porio, PhD

CCARPH Project Leader & Principal Investigator
Professor Emeritus, Ateneo de Manila University
Science Research Fellow, Manila Observatory
Senior Resilience Advisor, National Resilience Council
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ATENEO DE MANILA
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MANILA
OBSERVATORY



NATIONAL RESILIENCE COUNCIL



Canada



Climate disasters have intensified GLOBALLY-NATIONALLY, resulting in damage and losses to lives, property, and the ecosystem health; increasing the number of people in search of livelihoods/jobs, better social services and social protection.

PART 1. Climate Impact Drivers (CIDs)-floods, typhoons, SLR → Interact with Contextual Drivers of Risks and intensify their effects on Climate, Human System and with Social-Ecological Systems

→CASCADING RISKS vs. our linear, sectorally driven systems of action

Part II. TRANS-DISCIPLINARY INNOVATIONS in Climate and Disaster Resilience (CDR) thru collaborative, public-private-people partnerships (4Ps)

Part III. Synthesis/Need for Science-Based, Problem-focused, Solutions-Driven Climate Actions with Systems Lens →for Sustainable, Resilient Futures

→Highly Complex & Fluid World with Extreme Climate Events & Uncertain Futures w/ special Focus on Community Resilience hubs

NEED : Bridge Science-Policy-Practice Nexus for Climate and Disaster Resilience

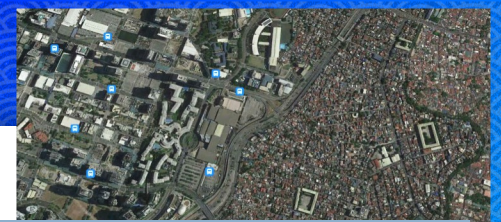
IPCC Report Summary for Policymakers, 2022

1

Increasing poverty levels, widening inequality, and creating new vulnerabilities, especially among the most exposed, vulnerable nations and populations like women, children, elderly, PWDs, LGBTQ+

2

Twin crises of our time, climate and social inequality, exacerbated by the COVID-19 Pandemic, intensifying vulnerability among those in already marginal and disadvantaged communities (Porio 2022) PLUS POLITICAL-ECO-SOCIAL/RESOURCE CONFLICTS & DISPLACEMENTS → UKRAINE WAR, ISRAELI-PALESTINE, CLIMATE DIASPORA, etc.



Rapid Urbanization + Social Inequality.
Bonifacio Global City (L) and Makati (R) (Google Earth)



Unemployment
due to COVID-19 lockdowns (Source)

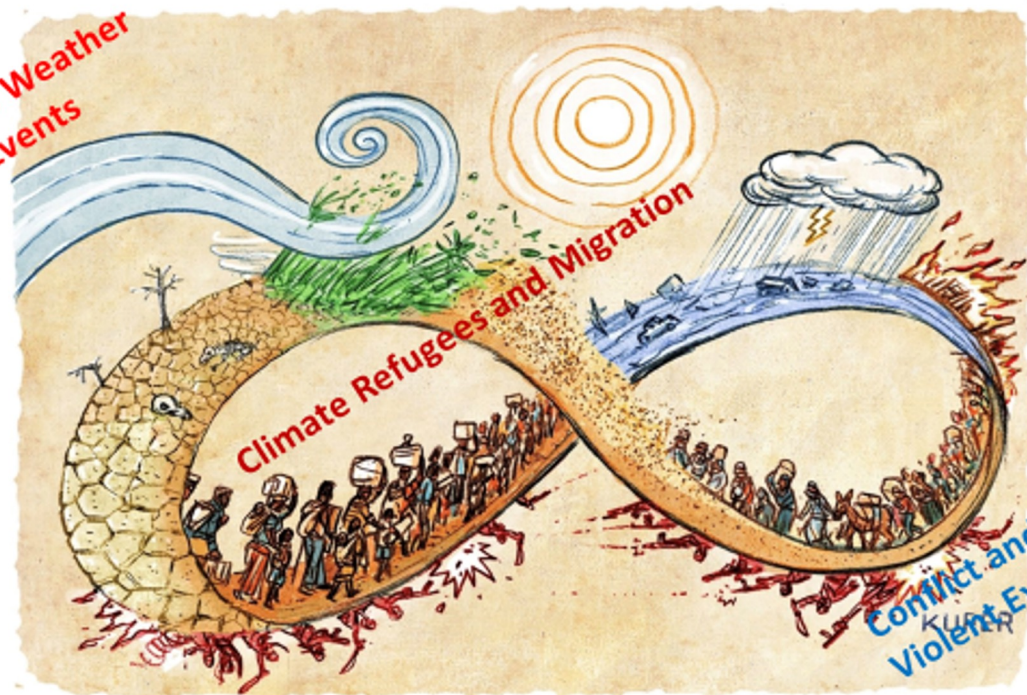


Interrupted education
due to school closures (NikkeiAsia)

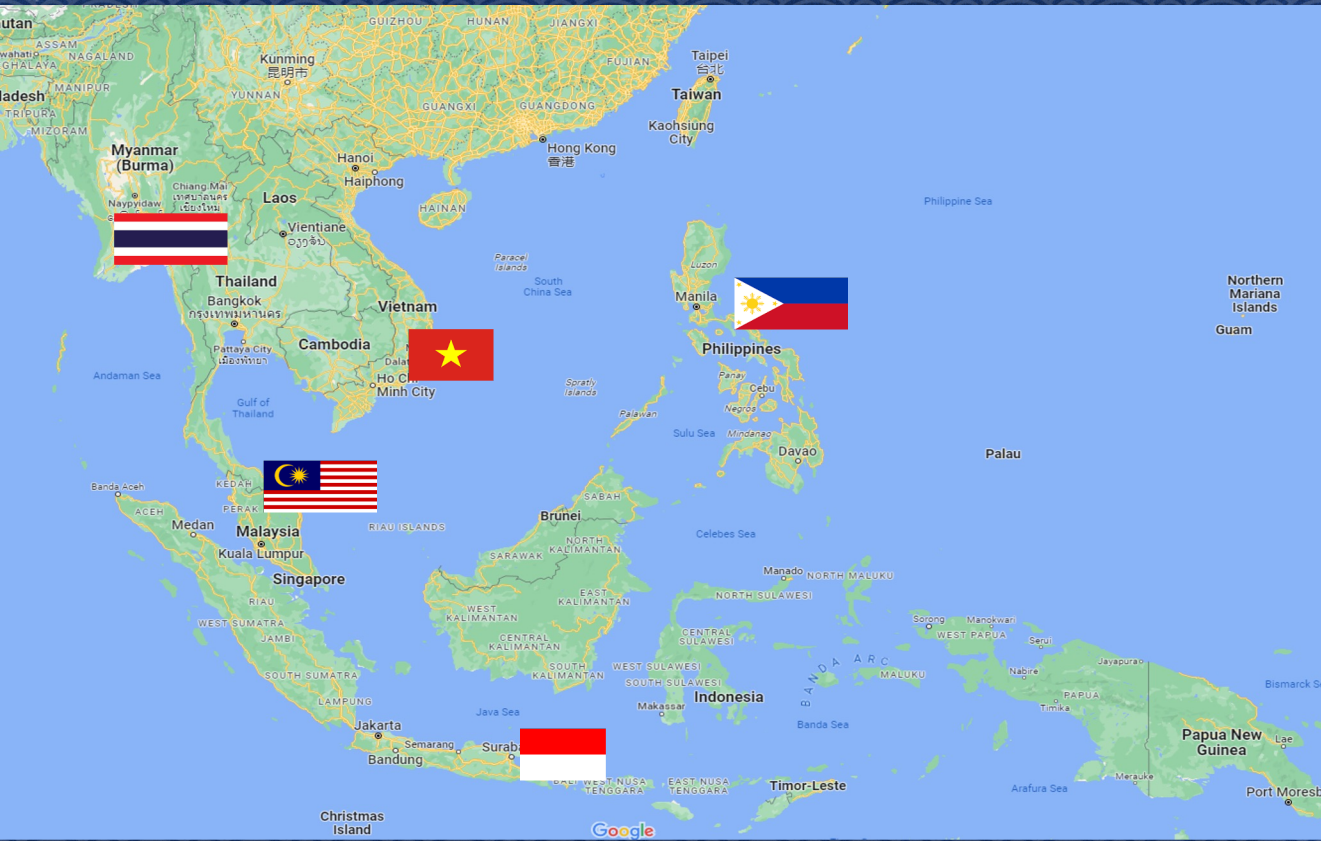


Coastal Inundation.
City of Bulacan.(UNDRR/Getty Images)

Extreme Weather
Events



Kuper / CartoonStock.com



90% of regional greenhouse gas emissions in South East Asia come from these 5 countries.

Climate Impact Drivers (Typhoons, Storm Surges, Sea Level Rise, Floods, Earthquakes, etc) Intensify Displacement, Poverty and Social Inequality due to Pol-Eco Resource Conflicts



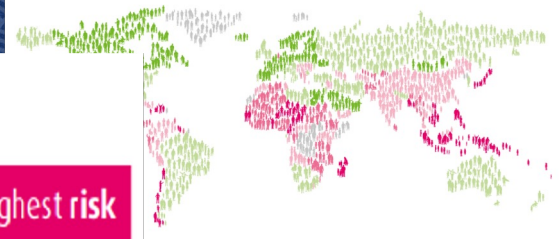
**PROFILING
INTERNALLY
DISPLACED
PERSONS OF
THE MARAWI
CONFLICT**



Post-Yolanda Leyte

Post-Disaster Situations in Urban-Rural Mindanao, Philippines





Strong need for action at a glance

The 15 countries with the highest exposure worldwide

Country	Exp. (%)
Vanuatu	63.66
Tonga	55.27
Philippines	52.46
Japan	45.91
Costa Rica	42.61
Brunei Darussalam	41.10
Mauritius	37.35
Guatemala	36.30
El Salvador	32.60
Bangladesh	31.70
Chile	30.95
Netherlands	30.57
Solomon Islands	29.98
Fiji	27.71
Cambodia	27.65

The 15 countries with the highest vulnerability worldwide

Country	Vuln. (%)
Chad	74.36
Eritrea	73.98
Afghanistan	73.61
Haiti	73.11
Niger	72.63
Central African Republic	72.50
Liberia	71.52
Sierra Leone	71.28
Mozambique	70.11
Guinea	70.01
Madagascar	69.30
Burundi	69.30
Mali	69.14
Guinea-Bissau	68.70
Nigeria	67.92

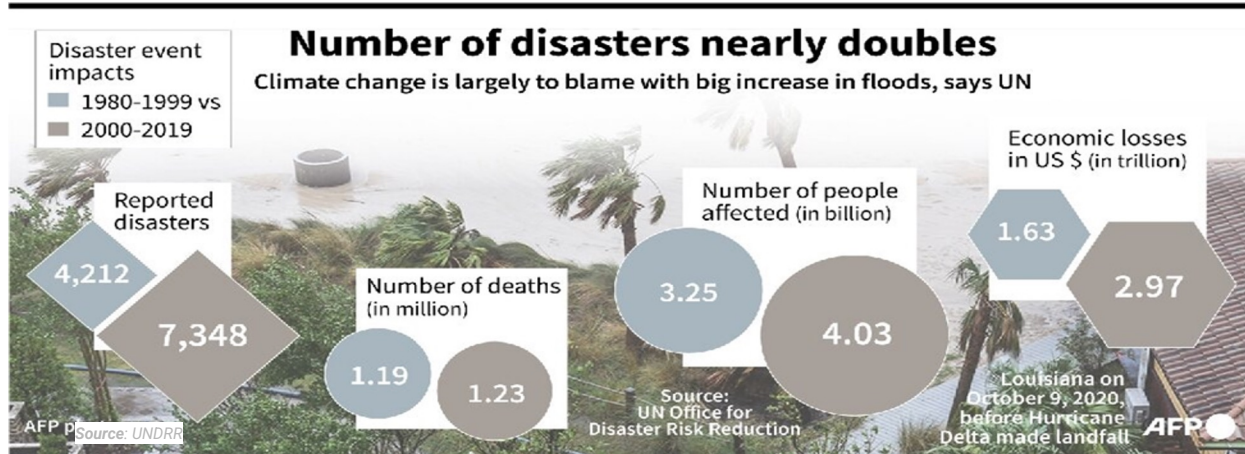
The 15 countries with the highest risk worldwide

Country	Risk (%)
Vanuatu	36.45
Tonga	28.57
Philippines	27.69
Guatemala	20.46
Bangladesh	19.57
Solomon Islands	18.77
Costa Rica	17.16
Cambodia	16.92
El Salvador	16.74
Timor-Leste	16.37
Papua New Guinea	16.34
Brunei Darussalam	16.22
Mauritius	15.11
Nicaragua	14.88
Fiji	13.50

Japan: 17th

Source: WorldRiskReport 2017

Intersectionality of Vulnerabilities: Climate, Environment, Economy, Development and Social Transformations



Naturalizing the social sciences



Socializing and humanizing the natural ecosystems

Problem-focused, solutions driven with a systems lens

→ **Development increases climate and disaster risks** as well as the impacts to already highly exposed and vulnerable communities, social and physical infrastructures, economy, livelihoods and **associated ecosystems!**

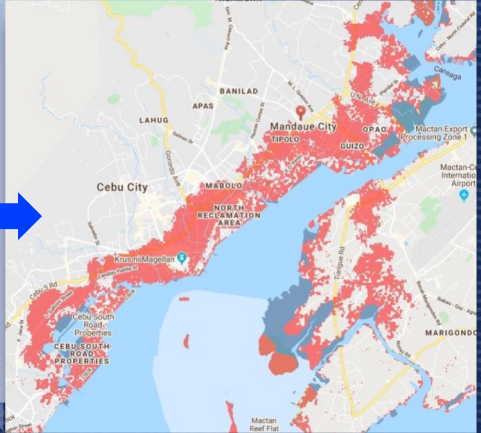
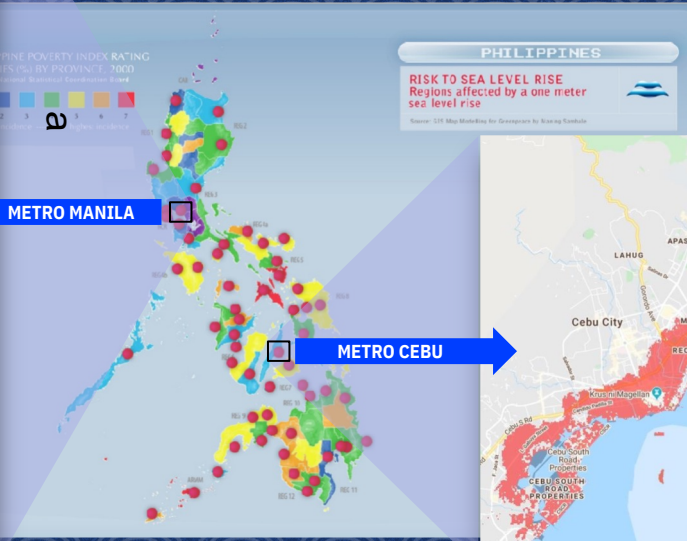
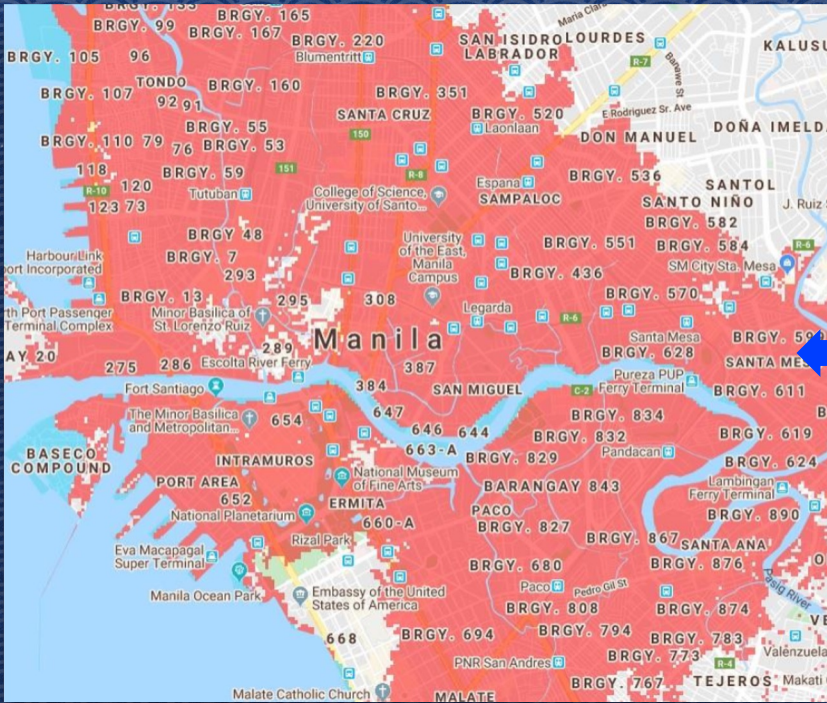
→ **Challenges to community resilience provide opportunities for building sustainable investments** → **growth**



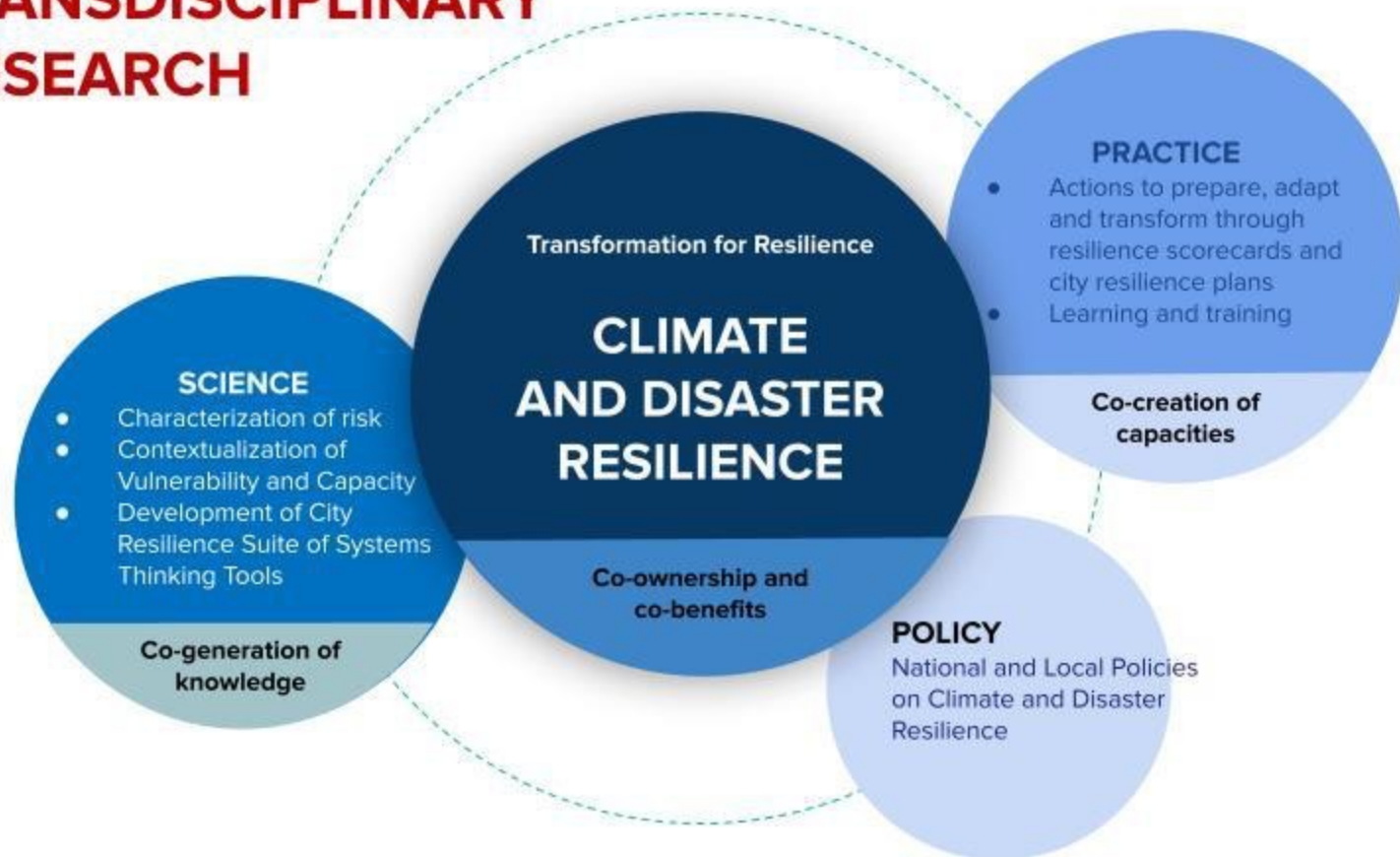
Aug 8, 2012. Habagat floods and damages around Bulacan, north of Manila, Philippines. (dnd/AFP/GettyImages)

Philippine Climate Change Context and Vulnerability: Metro Manila/Metro Cebu

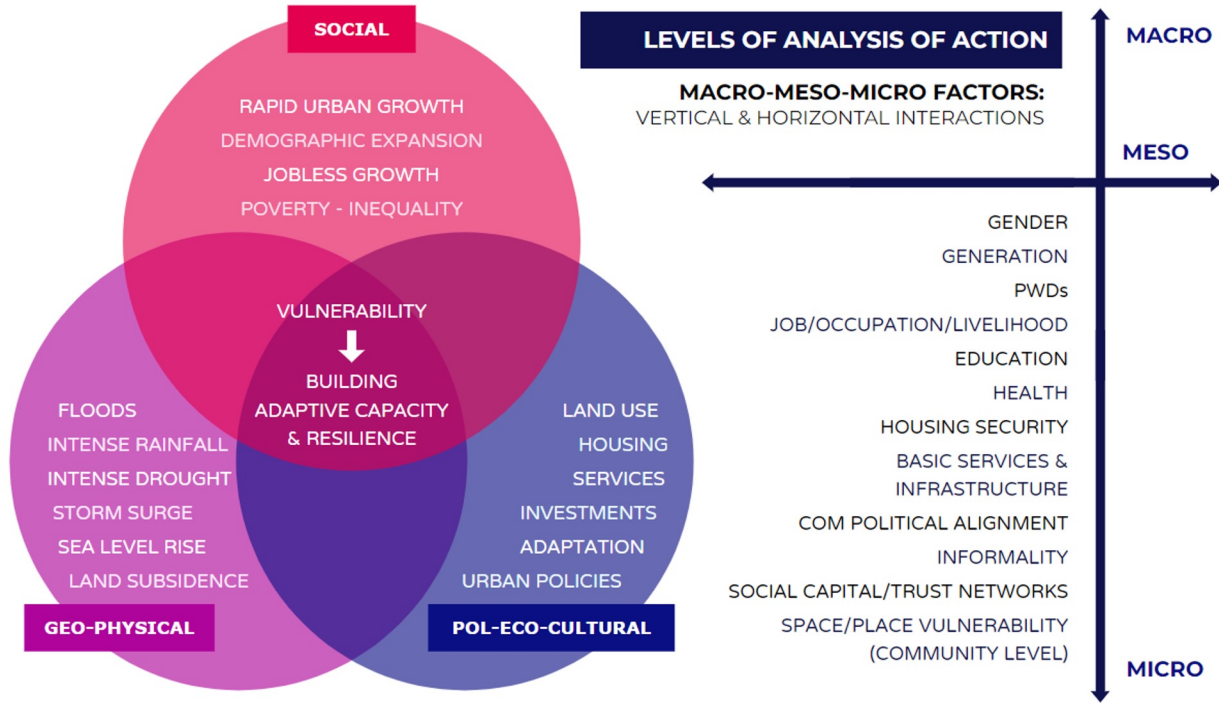
Projected coastal flooding in Metro Manila and Metro Cebu by 2050 due rising sea levels



BRIDGING SCIENCE-POLICY NEXUS: **TRANSDISCIPLINARY ACTION RESEARCH**

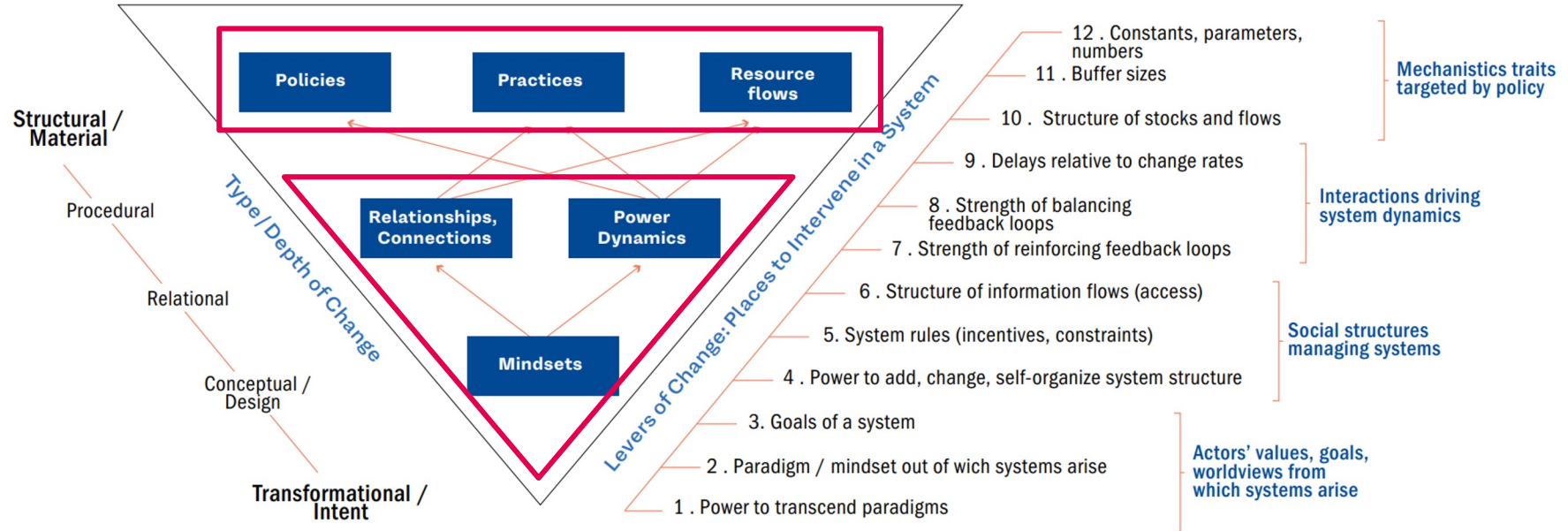


Approach: Intersectional Analysis of Vulnerability, Adaptation and Resilience in Metro Manila

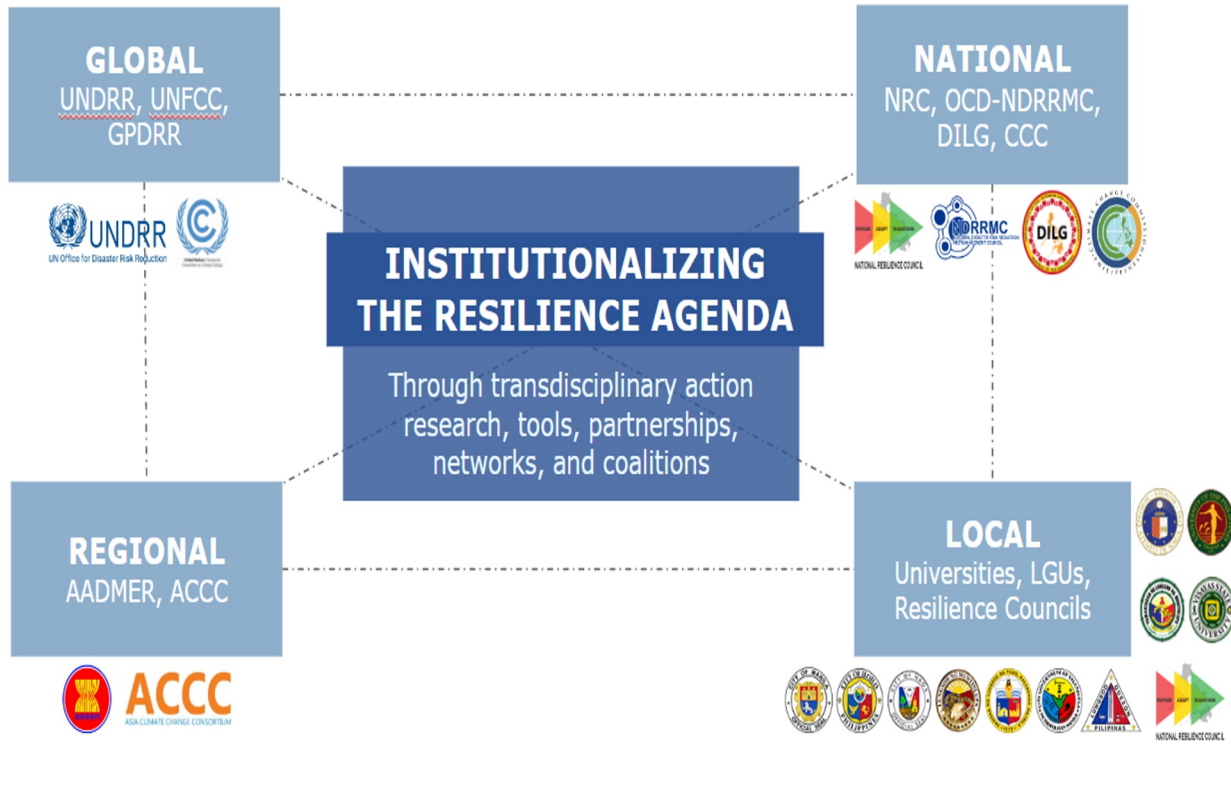


A Theoretical Lens for 'Transformation: Moving Science to Climate Action

Six Conditions of System Change



Strategy:
Vertical,
Horizontal,
Intersectional
Strengthen nest of
resilience



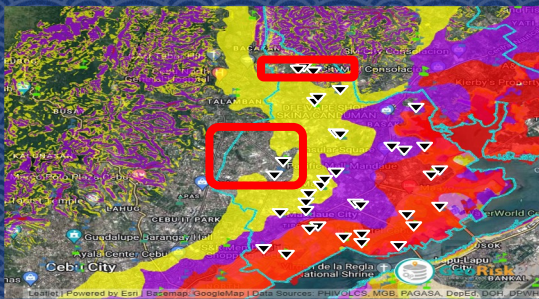
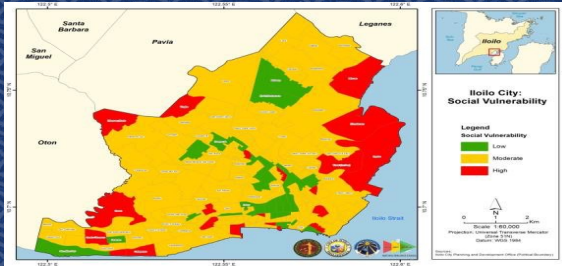
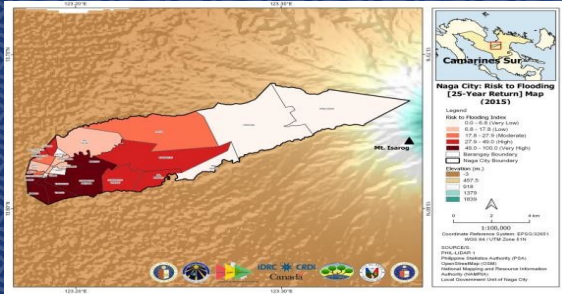
CCARPH Consortium of Resilient Cities



Metro Manila

Metro Naga

Metro Iloilo



Innovations for Incremental Adaptation

1 Resilience Innovation



Towards Community Resilience: AIC Installations in Partner Communities

ATENEO DE MANILA UNIVERSITY

Ateneo Innovation Center

IDRC · CRDI
International Disaster Reduction Center / Canadian International Development Organization

COASTAL CITIES AT RISK IN THE PHILIPPINES
Investing in Climate and Disaster Resilience



2 Art as a strategic pathway for risk and resilience communication



3 Mobilizing gender and resilience

ATENEO NATIONAL RESILIENCE COUNCIL MANILA OBSERVATORY IDRC · CRDI Cebu

GENDER AND RESILIENCE IN A COASTAL CITY: STORIES OF EQUITY AND SUSTAINABILITY FROM THE GROUND

MARCH 22, 2022
9:00 AM TO 1:00 AM (PHILIPPINE TIME) REGISTER: bit.ly/Gender-RegForm

KEYNOTE SPEAKERS:

- Hon. Jerry Treñas, Iloilo City Mayor, Western Visayas, Philippines
- Dr. Gay Delesta, University of the Philippines Visayas
- Ms. Donna Magno, Iloilo City Disaster Risk Reduction and Management Office (DRRMO)
- Mr. Maurice John Caban, Planning Unit, COVID-19 Department of Social Welfare and Development

Perspectives from the LGU and the Academia

- Prof. Bernadette Jocsing Albaña (Moderator), University of the Philippines Visayas
- Ms. Sylvia Elosoado, Asia Community in Lant, Jaro, Iloilo City
- Mr. Rogelio Elosoado, Asia Community in Lant, Jaro, Iloilo City
- Ms. Ana Catactan, Tiu Tio Tug Ana Rose Foundation High School
- Ms. Joyce Masamang Nagral, Tiu Tio Tug Ana Rose Foundation High School

Perspectives from the CSOs

- Ms. Sonia Cadornigara, Homeless Peoples Federation, Inc.
- Mr. Emmanuel Areno, Iloilo CODE NGO (Caucus of Development NGO networks)

INTRODUCTORY MESSAGE:

- Dr. Roberto C. Tap, Ateneo de Manila University
- Dr. Clement Campaño, University of the Philippines Visayas

COVENORS:

- Dr. Estela S. Parlo, Coastal Cities at Risk in the Philippines (CCARPH), Ateneo de Manila University / Manila Observatory
- Ms. Ma. Antonia Yule Loyaga, National Resilience Council / CCARPH, Ateneo de Manila University / Manila Observatory

PANEL OF ASSESSORS:

- Ms. Natalie U. Lim, Richmond Road Iloilo
- Prof. Jo Ferrer, University of the Philippines Visayas
- Prof. Cindy Jimenez, University of the Philippines Visayas

INTERVIEWER & FACILITATOR:

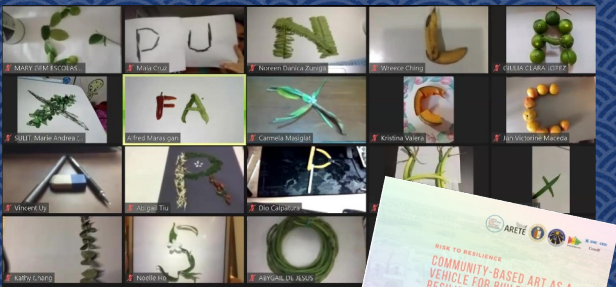
- Prof. Jessica Dato-Beretta, Coastal Cities at Risk in the Philippines, (MANILA) University of the Philippines Visayas

THIS event is an offshoot of the CCARPH 2021-2022 Gender and Resilience Program, and is open to all interested participants.

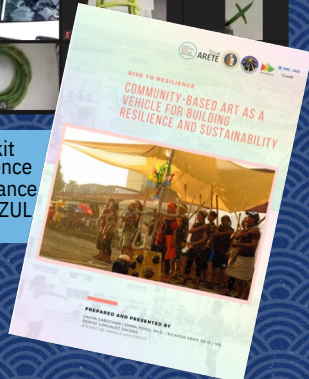
For inquiries, email us at ccarph@ateneo.edu or ccarph@ateneo.edu or ccarph@ateneo.edu

*Tentative program

4 Community-based arts for resilience



- Community Resilience Toolkit
- Youth Champions for Resilience
- Omehen: Gardens as Resistance
- Science Com Arts: RR and AZUL



MOVING SCIENCE TO ANTICIPATORY CLIMATE ACTION

1. TRANSFORMATIVE, CONTEXTUALLY DRIVEN INNOVATIONS FOR CDR
2. Important levers towards transformative adaptation demands that we understand the:
 - a. Underlying social relationships and power relations
 - b. Centering values of justice, equity, and inclusion for humans and non-humans
3. Invitation to be inspired/ACT: RE-IMAGINE, THINK & ACT FOR THE GREATER GOOD, so we can change the scale and depth of adaptation & contextually-driven innovations for transformative climate action towards just adaptation!



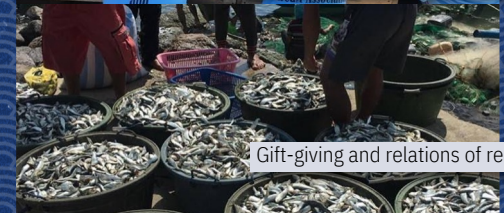
Bayanihan



Community-based disaster plan



Community-based savings and banking



Gift-giving and relations of reciprocity



Traditional + Scientific Knowledge for Adaptation

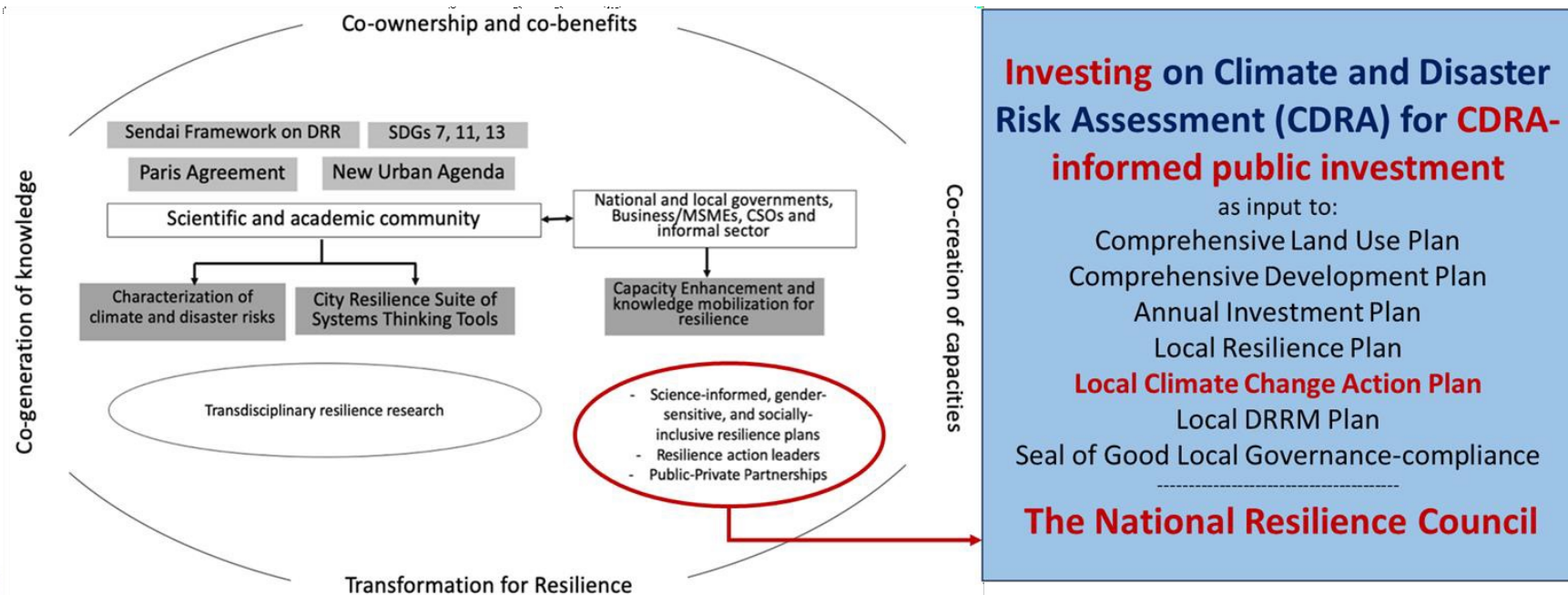
Innovations for Transformative Adaptation

Actionable science for decision-making: Data sets and models produced	Disaggregating resilience for a programmatic implementation in risk governance at national level: Defining Resilience through CCA-DRR Convergence	Unpacking resilience for programmatic implementation in risk governance at national and regional-global level	Transdisciplinarity and intersectionality in science-informed risk assessment: The Case of Climate and Disaster Risk Assessment (CDRA)
Climate and disaster risk-informed development planning & investments	Risk visualization and applied systems thinking tools for resilience	Champions for climate and disaster resilience among professionals	Public-Private-People partnerships in resilience building

Risk-informed, resilience driven investments in planning and development thru public-private people partnerships (4Ps)

2 Insert SciTech into Local Development and Planning

GOAL: Integrated Climate and Disaster Risk Assessment:
 Bases for Planning and Action Towards a Resilient Local
 Governance and Development →
Integrative, Convergent Pathways to Resilience



SAMBAYANIHAN

Public-Private-People Partnerships

RESEARCH &
SCIENCE

*Bridging Scientific
Knowledge & Community
Practices on Resiliency*

VULNERABLE
COMMUNITIES

PREPARE

ADAPT

TRANSFORM

Champion
Individual and
Collective Integrity

Culture of
Volunteerism

Collective
Accountability

Care for Creation

Convergence and
Coherence for
Resilience

Collaborative
Leadership

Community
Empowerment and
Engagement

Commitment
to Gender and
Inclusivity

Sama-Samang mga Sambayan natin sa Isang Matatag ng Boyan

NRC's SAMBAYANIHAN methodology

OWNERSHIP

CO-OWNERSHIP

CO-CREATION

CO-BENEFITS



The Resilient LGU Program: PREPARE, ADAPT & TRANSFORM

Adopt-A-City Program

(1) Province, (10) Cities, and (1) Municipality

PREPARE

How can we minimize loss of lives and assets?



Mandaue



Iligan



Tiwi



Baguio

ADAPT

How can we improve existing systems to prevent or reduce risks and vulnerability to hazardous events?

TRANSFORM

How can we change existing systems to achieve resilience?



Naga



Manila



Iloilo



CDO



Zamboanga



Iriga



Ormoc



Bataan



The Resilient LGU Program in Partner Cities

Adopt-A-City Program

RESILIENT LGSS SCORECARD BASELINING



5 Resilience Pillars (Human Development, Local Economy, Infrastructure, Environment, & Human Security)

BARANGAY RESILIENCE BINGO SCORECARD BASELINING

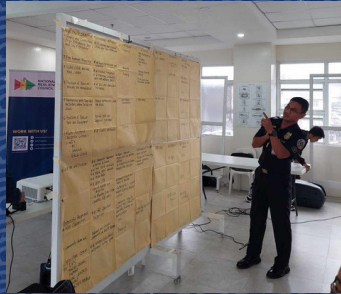




Adopt-A-City Program

LGU-Specific Interventions based on Gaps Identified in the Resilience Metrics Assessment

Investment Support to Command Center/Emergency Operations Center



Resilience Planning



Zamboanga



Iloilo



Manila



HEVC ASSESSMENT - Naga



Risk-informed Governance



Resilience 102 and Georisk Training - Manila

The Community Resilience Learning Hub aims to be a venue for resilience information, as well as an avenue for hands on demonstrations and co-innovation within the community.



CLEAN WATER SYSTEM

- Triple filtration system
- UV disinfection
- Possible smart cistern supplementation
- Alternative income stream



FOOD SECURITY

- HYDROPONICS
- Vermiculture
- Alternative food source
- Chemical free
- Assists in heat dissipation
- Remote monitoring via LoRa sensors
- Alternative income stream

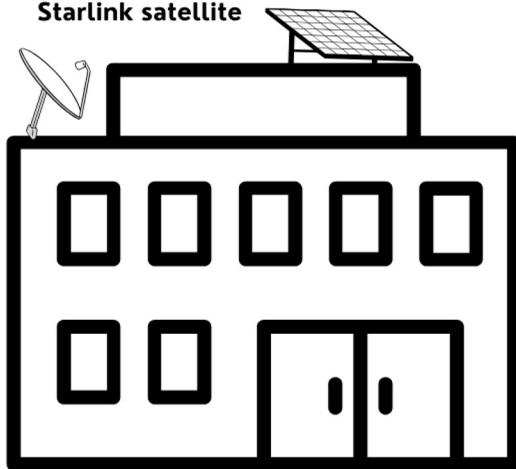


POWER SOURCE

- Lighting
- Cooling
- Device charging
- Food and beverage storage

10 kW Solar Panel
+ batteries and generator

Starlink satellite



NETWORK CONNECTIVITY

- Video conferencing
- Telemedicine
- Online Cloud storage



UNMANNED AERIAL VEHICLES

- Site mapping
- Drone assessments



TRAINING

- Information drives
- Community capacitation



NEARCLOUD

- Data storage
- Knowledge Management
- Offline information dissemination

UN SUSTAINABLE DEVELOPMENT GOALS



DISASTER RESILIENCE HUB



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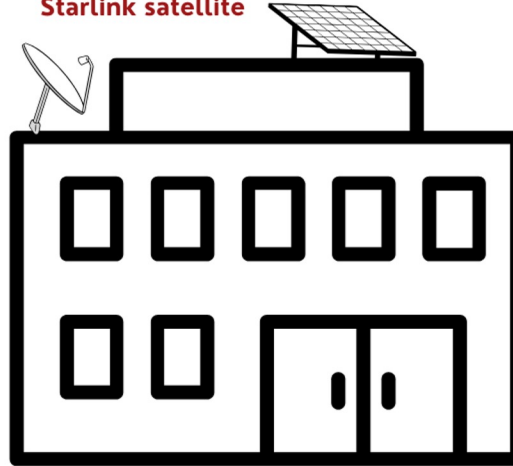


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DRR SERVICES

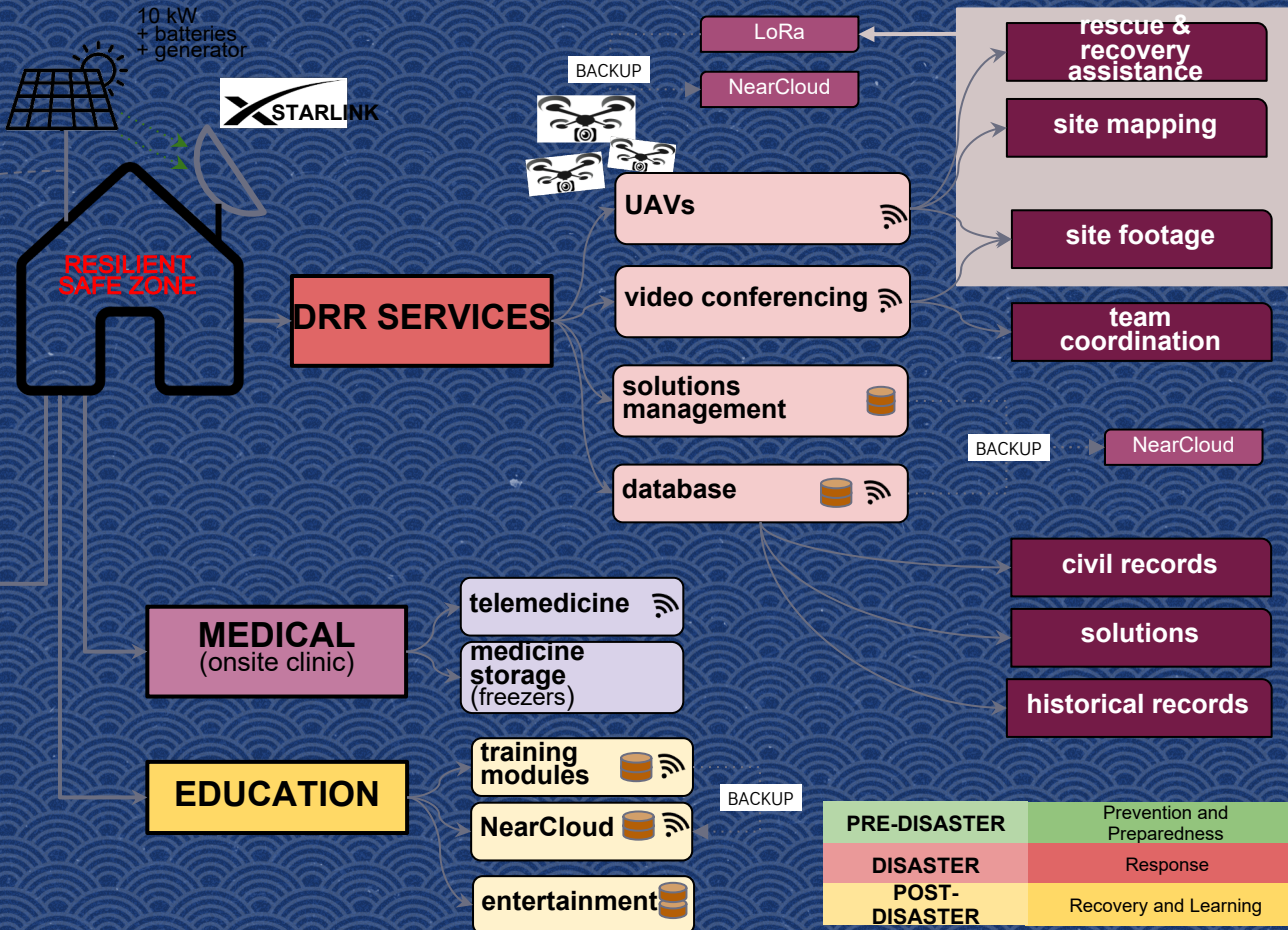
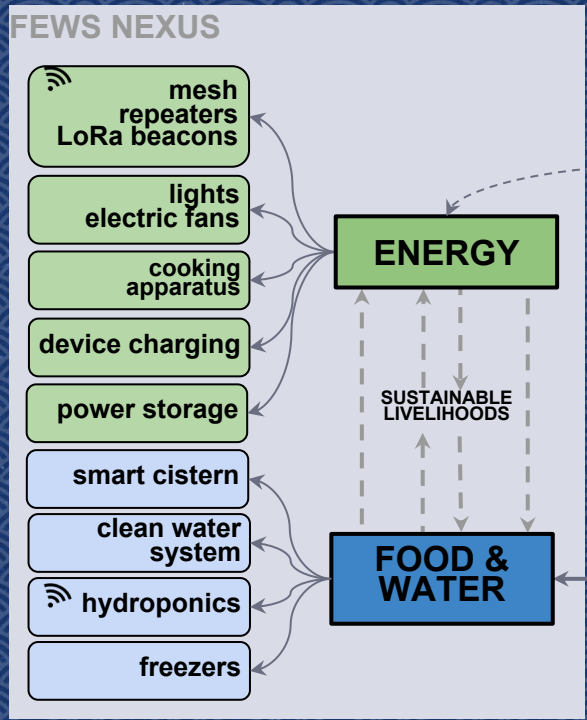
- Rescue and Recovery assistance
- Solutions Management
- Medical storage and resources

SAFE ZONE/EMERGENCY CENTER SYSTEM DESIGN

100 Families | Solar Power | Starlink Connectivity | Food | Energy | Water | InfoTech | Medical | Mobility

LEGEND

- cached content
- Starlink connectivity



PRE-DISASTER	Prevention and Preparedness
DISASTER	Response
POST-DISASTER	Recovery and Learning

FEWS Nexus in Action - Project DIGDI in Panicuason, Naga City



KEY MESSAGES for Scientists, Policy Makers, LEADERS, Civil Society, Private Sector, Practitioners and ALL:

We are at THE CROSSROADS of OUR Life in this planet, THESE ARE OUR URGENT NEEDS:

NEED 1: *ANTICIPATORY CLIMATE ACTION* → S & T → PREPARE, ADAPT AND TRANSFORM!!

NEED 2: *COLLABORATE* AND *INNOVATE* for CDR but *NAVIGATE* THE SYSTEMS OF S & T knowledge creation & mobilization for climate action with stakeholders

NEED 3: STRONG *COMMITMENT TO INVEST* IN A RISK-INFORMED, RESILIENCE DRIVEN PLANNING & DEVELOPMENT INVESTMENTS

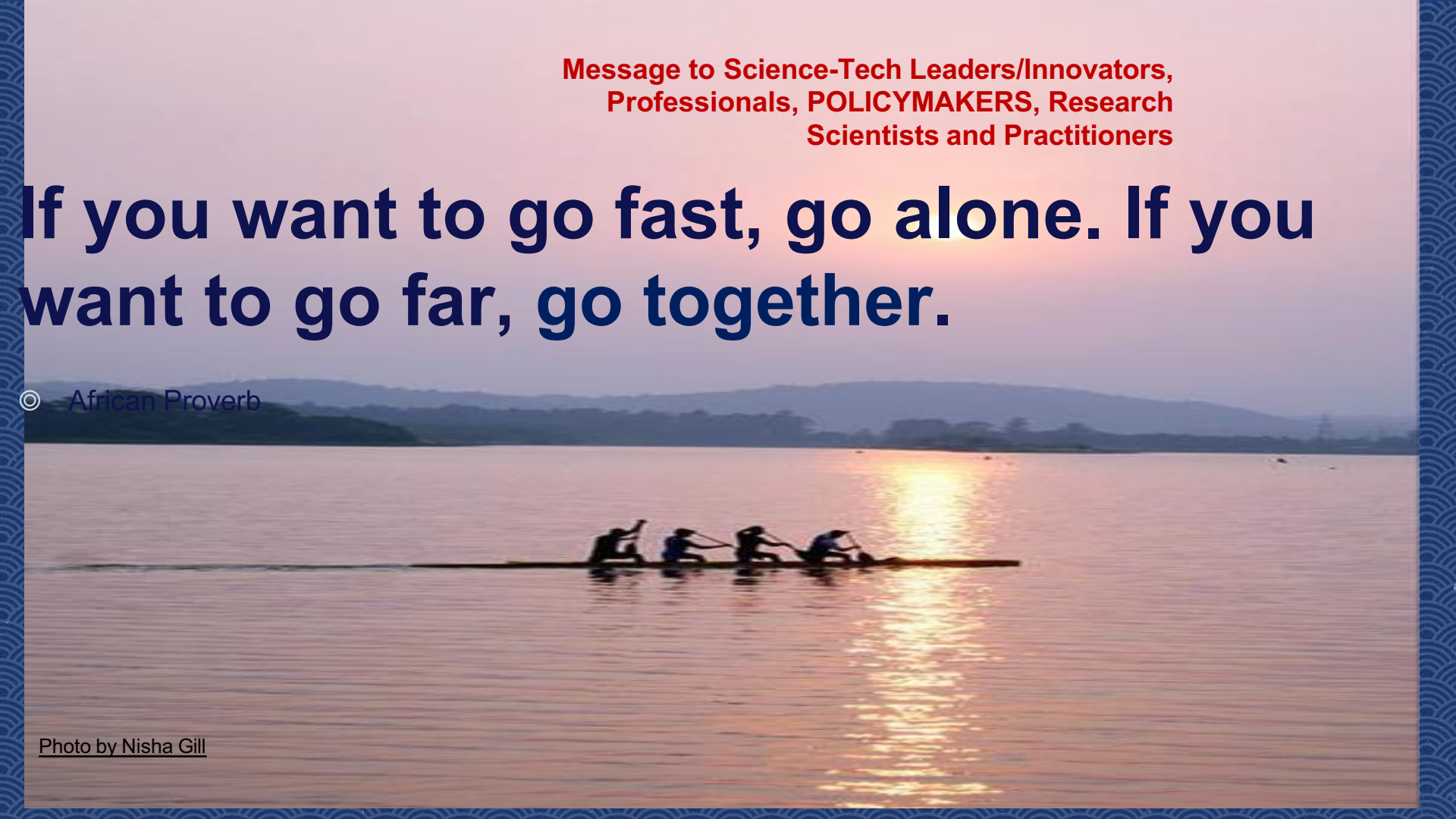
NEED 4: *CREATE SUPPORTIVE CONDITIONS FOR TRANSFORMATIVE CLIMATE ACTION*— COHERENT/CONVERGENT POLICY, PRACTICES, RESOURCE FLOWS → POWER, CONNECTIONS & CONNECTEDNESS TO A COMMON VISION OF INCLUSION, RESILIENCE & SUSTAINABILITY

**Message to Science-Tech Leaders/Innovators,
Professionals, POLICYMAKERS, Research
Scientists and Practitioners**

**If you want to go fast, go alone. If you
want to go far, go together.**

© African Proverb

Photo by Nisha Gill



CCARPH Organizational Chart



ATENEO



IDRC
Canada



Fr. Jose Ramon T. Villarín PhD
Project Holder (Jan. 2018-Jul. 2020)



Fr. Roberto C. Yap, SJ
Project Holder (Aug. 2020-Jan. 2021)



Principal Investigators



Jessica Dator-Bercilla
Principal Investigator
Iloilo Case Study Leader



Emma E. Porio PhD
Project Leader



Ma. Antonia Yulo-Loyzaga
Principal Investigator
Work Package 3 Leader



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Ph.D



Rajib Shaw,
DSc



Li Wei-sen,
Ph.D

International Project Advisers

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Anna Marie
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Barrameda, Jr.
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Carlos Primo
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Michael Armand
P. Canilao, Ph.D



Fernando P.
Siringan, Ph.D



Raymond S.
Rodolfo



Liza L.
Lim Ph.D

Pool of Experts

Work Themes I, II

Health



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator

Social Vulnerability



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator

Technologies



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



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Principal Investigator



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Principal Investigator



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Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator

Geo Spatial/ Visualizing Risks



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator

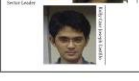
Computable General Equilibrium



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator

Systems Dynamics/ Systems Thinking



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator

Project Management



Project Manager

Project Manager



Project Manager

Project Manager



Project Manager

Project Manager

Work Theme III



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



Dr. Rhea M. Dela Cruz
Principal Investigator



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Pasig Case Study

Barangay Loyola Heights, Quezon City

Community Partners



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